ABSTRACT

A probe located in an area to be measured has an acoustic stimulator, (e.g., a loudspeaker and a microphone). The stimulator sends acoustic signals to the microphone where the signals are transformed into electrical signals and transferred to an analysis unit. Using a defined stimulation followed by a two-port chain transfer matrix connected to an impedance as a model, the voltage ratio between the stimulation and the impedance is described as a dimensionless transfer function of a complex function of the stimulation frequency. A series of acoustic calibration signals are generated by known acoustic impedances covering different calibration scopes using the stimulation. The calibration signals are recorded and the electric values are merged with the respective voltage values of the stimulation for evaluation of the respective transfer functions which are merged together into an over-determined linear system of equations. The impedance is determined by evaluating the transfer functions.